

What is claimed is:

1. A composite structure comprising:
 - a core portion having a pair of generally opposed surfaces;
 - a first fibrous layer disposed on a first surface of the core portion, the first fibrous layer comprising a plurality of fibres disposed substantially parallel to the first surface;
 - a second fibrous layer disposed on a second surface of the core portion, the second fibrous layer comprising a plurality of fibres disposed substantially parallel to the second surface; and
 - a first polymer layer disposed over the first fibrous layer and a second polymer layer disposed over the second fibrous layer;
wherein: (i) the first fibrous layer is partially embedded in both the core portion and the first polymer layer, and (ii) the second fibrous layer is partially embedded in the core portion and the second polymer layer.
2. The composite structure defined in claim 1, wherein the first polymer layer and the first surface of the core portion are in contact with one another.
3. The composite structure defined in claim 1, wherein the second polymer layer and the second surface of the core portion are in contact with one another.
4. The composite structure defined in claim 1, wherein the first polymer layer and the first surface of the core portion are in contact with one another, and the second polymer layer and the second surface of the core portion are in contact with one another.
5. The composite structure defined in claim 1, wherein the first polymer layer and the first surface of the core portion are chemically bonded to one another.
6. The composite structure defined in claim 1, wherein the second polymer layer and the second surface of the core portion are chemically bonded to one another.

7. The composite structure defined in claim 1, wherein the first polymer layer and the first surface of the core portion are chemically bonded to one another, and the second polymer layer and the second surface of the core portion are chemically bonded to one another.
8. The composite structure defined in claim 1, wherein the first surface and the second surface are substantially parallel to one another.
9. The composite structure defined in claim 1, wherein the first polymer coating and the second polymer coating combine to substantially completely cover the composite structure.
10. The composite structure defined in claim 1, wherein the core portion comprises a cellular material.
11. The composite structure defined in claim 1, wherein the core portion comprises a polymer foam.
12. The composite structure defined in claim 1, wherein the core portion comprises an isocyanate-based polymer foam.
13. The composite structure defined in claim 1, wherein the core portion comprises a polyurethane foam.
14. The composite structure defined in claim 1, wherein the core portion comprises a molded polyurethane foam.
15. The composite structure defined in claim 1, wherein the core portion comprises a non-cellular material.
16. The composite structure defined in claim 1, wherein the first fibrous layer and the second fibrous layer are the same.

17. The composite structure defined in claim 1, wherein the first fibrous layer and the second fibrous layer are different.
18. The composite structure defined in claim 1, wherein one or both of the first fibrous layer and the second fibrous layer are woven.
19. The composite structure defined in claim 1, wherein one or both of the first fibrous layer and the second fibrous layer are non-woven.
20. The composite structure defined in claim 1, wherein each of the first fibrous layer and the second fibrous layer contains at least one member selected from the group comprising glass fibres, polyester fibres, polyolefin fibres, Kevlar™ fibres, polyamide fibres, cellulose fibres, carbon fibres and mixtures thereof.
21. The composite structure defined in claim 1, wherein each of the first fibrous layer and the second fibrous layer comprises a fibreglass mat.
22. The composite structure defined in claim 1, wherein each of the first fibrous layer and the second fibrous layer comprises at least one member selected from the group comprising spun bound polyesters and paper.
23. The composite structure defined in claim 1, wherein the first polymer layer and the second polymer layer are the same.
24. The composite structure defined in claim 1, wherein the first polymer layer and the second polymer layer are different.
25. The composite structure defined in claim 1, wherein the first polymer layer and the second polymer layer are non-cellular.
26. The composite structure defined in claim 1, wherein the first polymer layer and the second polymer layer each comprise an isocyanate-based polymer.

27. The composite structure defined in claim 1, wherein the first polymer layer and the second polymer layer each comprise polyurea.

28. The composite structure defined in claim 1, wherein the first polymer layer and the second polymer layer each comprise polyurethane.

29. A vehicular body panel comprising the composite structure defined in claim 1.

30. A vehicular door panel comprising the composite structure defined in claim 1.

31. A vehicular flat bed panel comprising the composite structure defined in claim 1.

32. A process for producing a composite structure in a mold comprising a first mold half having a first surface and a second mold half having a second surface, the first mold half and the second mold half engagable to define a mold cavity, the process comprising the steps of:

(i) placing a first polymer layer in the first mold half;

(ii) placing a second polymer layer in the second mold half;

(iii) partially embedding a first fibrous layer in the first polymer layer, the first fibrous layer comprising a plurality of fibres disposed substantially parallel to the first surface;

(iv) partially embedding a second fibrous layer in the second polymer layer, the second fibrous layer comprising a plurality of fibres disposed substantially parallel to the second surface;

(v) placing a core portion in the mold cavity;

(vi) closing the first mold half and the second mold half; and

(vii) partially embedding each of the first fibrous layer and the second fibrous layer in the core portion.

33. The process defined in claim 32, wherein Step (v) comprises dispensing a liquid polymeric composition on a portion of a surface of one of the first mold half and the second mold half.

34. The process defined in claim 32, wherein Step (v) comprises dispensing a liquid foamable polymeric composition on a portion of a surface of one of the first mold half and the second mold half.
35. The process defined in claim 32, wherein Step (v) comprises dispensing a liquid foamable isocyanate-based polymeric composition on a portion of a surface of one of the first mold half and the second mold half.
36. The process defined in claim 32, wherein Step (vi) is conducted after Step (v).
37. The process defined in claim 32, wherein Step (v) is conducted after Step (vi).
38. The process defined in claim 32 wherein the first fibrous layer and the second fibrous layer are the same.
39. The process defined in claim 32, wherein the first fibrous layer and the second fibrous layer are different.
40. The process defined in claim 32, wherein one or both of the first fibrous layer and the second fibrous layer are woven.
41. The process defined in claim 32, wherein one or both of the first fibrous layer and the second fibrous layer are non-woven.
42. The process defined in claim 32, wherein each of the first fibrous layer and the second fibrous layer contains at least one member selected from the group comprising glass fibres, polyester fibres, polyolefin fibres, KevlarTM fibres, polyamide fibres, cellulose fibres, carbon fibres and mixtures thereof.
43. The process defined in claim 32, wherein each of the first fibrous layer and the second fibrous layer comprises a fibreglass mat.

44. The process defined in claim 32, wherein each of the first fibrous layer and the second fibrous layer comprises at least one member selected from the group comprising spun bound polyesters and paper.

45. The process defined in claim 32, wherein Step (i) comprises spraying a liquid material to substantially cover the first surface.

46. The process defined in claim 32, wherein Step (i) comprises spraying a liquid polymeric material to substantially cover the first surface.

47. The process defined in claim 32, wherein Step (i) comprises spraying a liquid polymeric reactive material to substantially cover the first surface.

48. The process defined in claim 32, wherein Step (i) comprises spraying a liquid isocyanate-based polymer reactive material to substantially cover the first surface.

49. The process defined in claim 32, wherein Step (ii) comprises spraying a liquid material to substantially cover the second surface.

50. The process defined in claim 32, wherein Step (ii) comprises spraying a liquid polymeric material to substantially cover the second surface.

51. The process defined in claim 32, wherein Step (ii) comprises spraying a liquid polymeric reactive material to substantially cover the second surface.

52. The process defined in claim 32, wherein Step (ii) comprises spraying a liquid isocyanate-based polymer reactive material to substantially cover the second surface.

53. A process for producing a composite structure in a mold comprising a first mold half having a first surface and a second mold half having a second surface, the first mold half and the second mold half engagable to define a mold cavity, the process comprising the steps of:

- (i) placing a first fibrous layer in the first mold half;
- (ii) placing a second fibrous layer in the second mold half;
- (iii) partially embedding the first fibrous layer and the second fibrous layer in a core portion to cause the first fibrous layer to be oriented substantially parallel to the first surface and the second fibrous layer to be oriented substantially parallel to the second surface;
- (iv) placing the core portion in the a mold cavity;
- (v) dispensing a first liquid polymeric composition between the first surface the first fibrous layer and a second liquid polymeric composition between the second surface the second fibrous layer; and
- (vi) causing the first liquid polymeric composition to form a first polymer layer which is partially embedded in the first fibrous layer and the second liquid polymeric composition to form a second polymer layer which is partially embedded in the second fibrous layer.

54. The process in claim 53, wherein Step (v) comprises injecting a liquid material to substantially encapsulates the core portion.

55. The process in claim 53, wherein Step (v) comprises injecting a liquid polymeric material to substantially encapsulates the core portion.

56. The process in claim 53, wherein Step (v) comprises injecting a liquid polymeric reactive material to substantially encapsulates the core portion.

57. The process in claim 53, wherein Step (v) comprises injecting a liquid isocyanate-based polymer reactive material to substantially encapsulate the core portion.